Page 1, between lines 4 and 5 has been amended to include the following:

CLAIM FOR PRIORITY

A1

This application claims priority to International Application No. PCT/DE00/00170 which was published in the German language on August 3, 2000.

TECHNICAL FIELD OF THE INVENTION

Please replace the paragraph beginning on page 1, line 4, with the following rewritten paragraph:

A2

The invention relates to the field of machine elements for designing a composite of two parts, and in particular, to composite of which one is a rare-earth permanent magnet and the other is a metallic support.

Page 1, between lines 7 and 8, has been amended to include the following:

BACKGROUND OF THE INVENTION

Please replace the paragraph beginning on page 1, line 8, with the following rewritten paragraph:

A3

In a known composite of this type (DE 195 38 468 A1), a first part in the form of a cuboid permanent magnet is screwed onto a second part in the form of a cylindrical axle of a magnetic clutch. An epoxy resin-based glue which has a dual curing mechanism is used for this.

Page 2, between lines 5 and 6, has been amended to include the following:

SUMMARY OF THE INVENTION

A4

In one embodiment of the invention, there is a composite having two parts. The composite being formed using a thermally curable glue that forms a spaced joint which includes for example, a rare-earth permanent magnet having a joint surface of at least 1000 mm^2 and a metallic support which is a ferromagnetic pole of an electrical machine. The glue includes an addition-crosslinking, single-component and self-adhesive silicone glue, the glue layer having a layer thickness of about 70 to 150 μm and includes spherical spacers in an amount of about 0.5 to about 5% by weight of the glue mass.

In one aspect of the invention, the diameter of the spacers and a thickness of the glue layer is between about 100 and about 125 μm.

DETAILED DESCRIPTION OF THE INVENTION

A4

The invention is based on the discovery that a glue, as described in the Background of the Invention, is not suitable for the permanent bonding of certain large-surfaced parts, such as a rare-earth permanent magnet and an iron pole of an electrical machine. This is because the thermomechanical property level of the epoxy resin glue is not matched in such a way, to the opposed thermal expansion coefficients of the elements to be used, that the elasticity of the bond produced could meet the extreme requirements which exist whenever two glued parts with an opposed thermal expansion coefficient are used in a temperature range of from –30°C to 150°C. Such conditions are encountered, for example, in permanent-field synchronous motors for the propulsion systems of ships (Jahrbuch der schiffbautechnischen Gesellschaft [Shipbuilders' yearbook] 81 (1987), pp. 221 to 227). Depending on the size of the glued permanent magnets, and therefore on the size of the joint surface, thermally induced length-change differences between the glued parts of up to a few hundred μm can occur. The elasticity of the glued point or bond should permit such length-change differences.

Please replace the paragraph beginning on page 2, line 6, with the following rewritten paragraph:

A5

The invention discloses design of a composite, in such a way as to provide a composite which is stable over a wide temperature range even for parts with an opposed expansion coefficient and a large joint surface.

Please replace the paragraph beginning on page 2, line 12, with the following rewritten paragraph:

A6

In one embodiment, a joint surface of the rare-earth permanent magnet of at least 1000 mm^2 and a ferromagnetic pole of an electrical machine as metallic support, the glue includes an addition-crosslinking, single-component and self-adhesive silicone glue, the glue layer having a layer thickness of from about 70 to about 150 μm and includes spherical spacers in an amount of from 0.5 to 5% by weight of the glue mass.

Please replace the paragraph beginning on page 2, line 22, with the following rewritten paragraph:

A7

Such a joint is distinguished by a highly elastic bond that is stable over a wide temperature range, with very good adhesion on the two parts. To adjust the spaced joint, spacers in the form of glass and/or ceramic spheres have proved advantageous. The glass and/or ceramic spheres are either incorporated into the silicone glue before it is applied to one of the parts, or is scattered over the pre-applied silicone glue bed while the joint is still open. Spacers having a thickness of between about 100 and about 125 µm are preferably used. The proportion in the silicone adhesive is preferably from 0.75 to 3, in particular approximately 1% by weight, expressed in terms of the total silicone glue mass.

Please replace the paragraph beginning on page 3, line 4, with the following rewritten paragraph:

A8

When producing the composite, it is sufficient if the silicone glue is applied to one of the parts to be bonded. Application of the glue can be made to either of the two parts. The silicone glue is in this case, e.g. spread or applied using a dispenser technique to the parts.

Please replace the paragraph beginning on page 4, line 5, with the following rewritten paragraph:

A9

Hence, the silicone glue must compensate, in the working temperature range, for length changes which - expressed in terms of the dimensions of the magnetic pieces - may be a few 100 µm. If the elasticity is insufficient, stresses occur in the glue bond so as to cause strength losses and premature failure of the bond. This has been confirmed by shear-strength studies on bonds, especially after exposure to heating cycles.

Please replace the paragraph beginning on page 4, line 13, with the following rewritten paragraph:

A10

The production of a composite design according to the invention will be explained below.